

REMARKS:

Claims 1-10 are in the case and presented for consideration.

Claims 1-6 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,535,405 to Hill.

Initially, applicant notes that the Office appears to be referring to segments from related U.S. Patent 4,631,657 to Hill. The Office refers to col. 7, lines 57-68 and col. 8, lines 1-25. It is applicant's understanding that the basis for rejection is Hill '405, and not Hill '657. Therefore, it is believed that the proper references should be col.7, lines 60-68 and col. 8, lines 1-28.

Turning to the merits of the case, applicant has rewritten independent claims 1, 5, and 6 to improve the clarity or understanding of the claims. The changes and/or additions are not required to overcome the prior art or any other statutory reason since applicant reasserts arguments from the previous response which were deemed moot in view of the current rejection. For this reason applicants are entitled to a full scope of protection for rewritten claims 1, 5, and 6 including any judicially created doctrines such as the Doctrine of Equivalents.

It is applicant's understanding from the rejection and the interview conducted on Tuesday, April 19, 2005 by the undersigned, that the examiner construes operation profile and objective function based on Hill's teaching of the determination of an error between an actual position and theoretical or commanded position of a stepper motor shaft. However the Office's position is incorrect for the reasons explained below.

Applicant respectfully submits that Hill '405 does not teach or suggest at least one element or limitation recited in the claims.

Claim 1 now recites:

an interface computer connected between the host computer and the stepper motor having program means for executing a real-time controller program which receives real-time feedback from the stepper motor to obtain a measured operation profile for mathematically obtaining an objective function value and modifying the initial step time sequence instructions to produce optimized step time sequence instructions, so that the measured operation profile is modified to approach the desired operation profile, the interface transmitting the optimized step-time sequence instructions to the stepper motor.

First, Hill '405 does not teach or suggest desired and measured operation profiles. The objective function value is a measure of how closely the physical system response matches the desired response, as explained in the specification on page 19. In claim 1, the physical system response and the desired system response are referred to as desired and measured operation profiles. Operation profiles for a stepper motor define the rotational motion of the stepper motor. The actual and theoretical position in Hill '405 cannot be construed as operation profiles since they do not define the rotational motion of the stepper motor.

Also, as explained in the previous Office Action response, the error between the actual and theoretical or commanded position of the stepper motor shaft is not concerned with how close the positions are to each other. In other words, the error is not concerned with matching the actual position to a theoretical position. Instead, this error is concerned with how far apart the actual and theoretical positions are so that a force can be sensed and controlled. (col. 16, lines 1-51). The Hill '405 patent is not concerned with bringing the theoretical and actual positions closer. By stark contrast, claim 1 recites "that the measured operation profile is modified to approach the desired operation profile." In other words, claim 1 recites that the measured operation profile is modified to be brought closer to the desired operation profile. Hill '405 does not teach or suggest this limitation.

Accordingly, Hill '405 also does not teach or suggest optimized step-time sequence instructions. Hill '405 is not concerned with optimizing. Hill '405 is only concerned with how far apart the actual and theoretical positions are so that a force can be sensed and controlled. (col. 16, lines 1-51). Notably, the Office has not indicated what is being optimized in Hill '405. The Office should clearly explain what is being optimized in Hill '405 so that applicant may better understand the rejection.

In addition, according to claim 1, the step time sequence is modified, and accordingly, the measured operation profile of the stepper motor, is modified. As explained above, the operation profile defines the rotational motion of the stepper motor. By comparison, the command sequence in Hill '405 is derived from low-level motion elements which are the only element in Hill '405 that defines rotational motion of the stepper motor (see col. 15, lines 3-32). Although the command sequence of Hill is modified, the low-level motion elements from the which the command sequence is derived, are not modified. Therefore, Hill '405 does not teach or suggest a measured operation profile that is modified.

Claim 1 is believed to be patentable for the reasons stated above. Claims 2-4 depend from claim 1, and are therefore believed to be patentable for at least the reasons described above.

Independent claims 5 and 6 are also believed to be patentable for at least the same reasons as claim 1. Furthermore, claims 5 and 6 recite at least one element or limitation not taught or suggested by the prior art.

Claims 5 and 6 recite "program means perturbing each time step" (claim 5) or "running an optimization program...for determining perturbations to the step-time sequence instructions." (claim 6)

Initially, applicants note that the terms "perturbing" and "perturbation" are not mentioned anywhere in the Office Action. These terms were previously recited in claim 5 (as originally filed) and therefore, are not newly recited elements or limitations. As the Office is no doubt aware, all limitations of a claim must be considered meaningful, and, "the PTO must consider all claim limitations when determining patentability of an invention over the prior art." *In Re Lowry*, 32 USPQ2d 1031, 1034 (Fed Cir. 1994). The Office does not appear to have considered the limitation of a program means perturbing each time step, and evaluating the objective function for each perturbation, as recited in claim 5. Otherwise, such consideration would have been shown.

Nevertheless, Hill '405 does not teach or suggest "perturbing each time step," as recited in claim 5, or "determining perturbations to the step-time sequence instructions" as recited in claim 6. Hill '405 does not teach or suggest incrementally changing the step-time sequence or determining increments of change to the step-time sequence instructions. Nor does Hill '405 teach evaluating an objective function value for each perturbation as recited in claim 5.

Furthermore, Hill '405 does not teach or suggest inputting an objective function value into an algorithm to determine perturbations to the step-time sequence instructions. Hill '405 does not teach any algorithms.

Hill '405 also does not teach repetition, as recited in claim 8, for minimizing the objective function value and bringing the measure operation profile closer to the desired operation profile.

New claims 9-10 are believed to be patentable for at least the reasons described above.

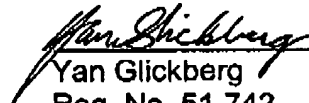
Accordingly, the application and claims are believed to be in condition for allowance,

and favorable action is respectfully requested. No new matter has been added.

If any issues remain which may be resolved by telephonic communication, the Examiner is respectfully invited to contact the undersigned at the number below, if such will advance the application to allowance.

Favorable action is respectfully requested.

Respectfully submitted,


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